ECOLOGICAL MONOGRAPHS

OFFICIAL PUBLICATION OF THE ECOLOGICAL SOCIETY OF AMERICA

Volume 44, 1974

Published Quarterly by

The Duke University Press

Durham, N. C., U. S. A.

ECOLOGICAL MONOGRAPHS

A QUARTERLY JOURNAL FOR ALL PHASES OF ECOLOGY

MANAGING EDITOR: CRAWFORD G. JACKSON, JR., Department of Biology, San Diego State University, San Diego, California 92182

BOARD OF EDITORS

Robert L. Burgess (Book Review Editor, ESA) Boyd D. Collier

Arthur W. Cooper

Kenneth W. Cummins Richard T. T. Forman

James E. Heath

Robert T. Paine Peter W. Price

G. G. Spomer Richard J. Vogi

Richard G. Wiegert

Stephen E. Fienberg

Simon Levin John M. Neuhold

Claire L. Schelske

Mary F. Willson

Martha J. Poole

Division of Environmental Sciences, ORNL, Oak Ridge, Tennessee 37830

Department of Biology, San Diego State University, San Diego, California 92182

Assistant Secretary for Resource Management, Department of Natural and Economic Resources, 116 W. Jones Street, Raleigh, North Carolina 27611

W. K. Kellogg Biological Station, Hickory Corners, Michigan 49060 Department of Botany, Rutgers University, New Brunswick, New Jersey 08903 Department of Zoology, University of Florida, Gainesville, Florida 32611

Department of Zoology, University of Washington, Seattle, Washington 98105

Department of Entomology, University of Illinois, Urbana, Illinois 61801 Department of Biology, University of Idaho, Moscow, Idaho 83843

Department of Biology, California State University, Los Angeles, California 90032

Department of Zoology, University of Georgia, Athens, Georgia 30601

ASSOCIATE EDITORS

Department of Applied Statistics, University of Minnesota, St. Paul, Minnesota 55101 Section of Ecology and Systematics, Cornell University, Ithaca, New York 14850 Director, Ecology Center, Utah State University, Logan, Utah 84321

Great Lakes Research Division, University of Michigan, Ann Arbor, Michigan 48104

Provisional Department of Ecology, Ethology, and Evolution, Vivarium Building, University of Illinois, Champaign, Illinois 61820

COPY EDITORS

Department of Biological Sciences, Purdue University, West Lafayette, Indiana 47907 Ruth Ann Miller

Department of Biology, San Diego State University, San Diego, California 92182

Subscription price: the United States, \$20.00 per year; Canada and the Pan-American countries add 40¢ postage; all others add 75¢. Single numbers of the current volume are \$5.00. Back numbers, \$20.00 per volume, \$5.00 per number. Missing numbers will be supplied free when lost in the mails if written notice is received by Duke Press within one month of the date of issue. All remittances should be made payable to the Duke University Press, Box 6697, College Station, Durham, North Carolina 27708.

Orders and materials for library exchange should be sent to Duke University Library, Gift and Exchange Department, Durham, North Carolina 27706.

STATEMENT OF OWNERSHIP AND MANAGEMENT

ECOLOGICAL MONOGRAPHS is published quarterly in Winter, Spring, Summer, and Autumn of each year by Duke University Press. The Office of Publication and the General Business Office are located at Post Office Box 6697, College Station, Durham, North Carolina 27708. The Publisher is the Ecological Society of America. The Managing Editor is Crawford G. Jackson, Jr., Department of Biology, San Diego State University, San Diego, California 92182. The Business Manager is Ralph E. Good, Department of Biology, Rutgers University, Camden, New Jersey 08102. The Owner is the Ecological Society of America. There are no bond holders, mortgagees, or other security holders.

EXTENT AND NATURE OF CIRCULATION

Average number of copies each issue during preceding 12 months: 3800 (total number copies printed), 0 (sales through dealers and carriers, street vendors and counter sales), 3510 (mail subscriptions), 3510 (total paid circulation), 37 (samples, complimentary, and other free copies), 0 (copies distributed to news agents, but not sold), 3547 (total distribution), 253 (official use, left-over, unaccounted, spoiled after printing), 3800 (total). Actual number of copies of single issue published nearest to filing date: 3800 (total number of copies printed), 0 (sales through dealers and carriers, street vendors and counter sales), 3645 (mail subscriptions), 3645 (total paid circulation), 4 (samples, complimentary, and other free copies), 0 (copies distributed to news agents, but not sold), 3649 (total distribution), 151 (office use, left-over, unaccounted, spoiled after printing), 3800 (total).

TABLE OF CONTENTS

VOLUME 44, 1974

NUMBER 1, WINTER

Autecological Studies of Three Species of Callitriche Native in California Esther G. McLaughlin	1-16
Energy-Exchange Analysis of the Belding Ground Squirrel and Its Habitat	17-44
A Population Study of Irradiated Desert Rodents N. R. French, B. G. Maza, H. O. Hill, A. P. Aschwanden, and H. W. Kaaz	45-72
The Role of Pin Cherry (Prunus pensylvanica L.) in the Maintenance of Stability in Northern Hardwood Ecosystems	73-88
Role of Learning in Insect Parasitism	89-104
Biological Accommodation in the Benthic Community at McMurdo Sound, Antarctica Paul K. Dayton, Gordon A. Robilliard, Robert T. Paine, and Linnea B. Dayton	105-128
Number 2, Spring	
Interspecific Competition Between Tadpoles of Rana pipiens and Rana sylvatica: An Experimental Field Study	129-151
Populations and Local Extinctions of Birds on Barro Colorado Island, Panamá Edwin O. Willis	153-169
Polychaete Abundance Patterns in a Marine Soft-Sediment Environment: The Importance of Biological Interactions	171–187
Role of Resource Allocation, Aggression and Spatial Heterogeneity in Coexistence of Two Competing Intertidal Starfish Jane Lubchenco Menge and Bruce A. Menge	189-209
Interactions Between a Sea Pen and Seven of its Predators	211-232
The Hubbard Brook Ecosystem Study: Forest Biomass and Production R. H. Whittaker, F. H. Bormann, G. E. Likens, and T. G. Siccama	233-254
Number 3, Summer	
The Export of Nutrients and Recovery of Stable Conditions Following Deforestation at Hubbard BrookF. H. Bormann, G. E. Likens, T. G. Siccama, R. S. Pierce, and J. S. Eaton	255-277
The Habitats of 17-year Periodical Cicadas (Homoptera: Cicadidae: Magicicada spp.)	279-324
Vegetation, Soil, and Climate on the Green Mountains of Vermont Thomas G. Siccama	325-349
Seasonal Variation in Composition, Plant Biomass, and Net Primary Productivity of a Tropical Grassland at Kurukshetra, India	351-376
Number 4, Autumn	
Primary Production in the Plankton Community of a Tropical Lake William M. Lewis, Jr.	377-409
Relationships of Ring Widths in Arid-Site Conifers to Variations in Monthly Temperature and Precipitation	411-440
Analysis of a North Dakota Gallery Forest: Vegetation in Relation to Topographic and Soil Gradients	441–464
Stability in Relation to Nutrient Enrichment in Arthropod Consumers of Old-Field Successional Ecosystems	465-482
Models for Age-Specific Interactions in a Periodic Environment G. Oster and Y. Takahashi	483-501